

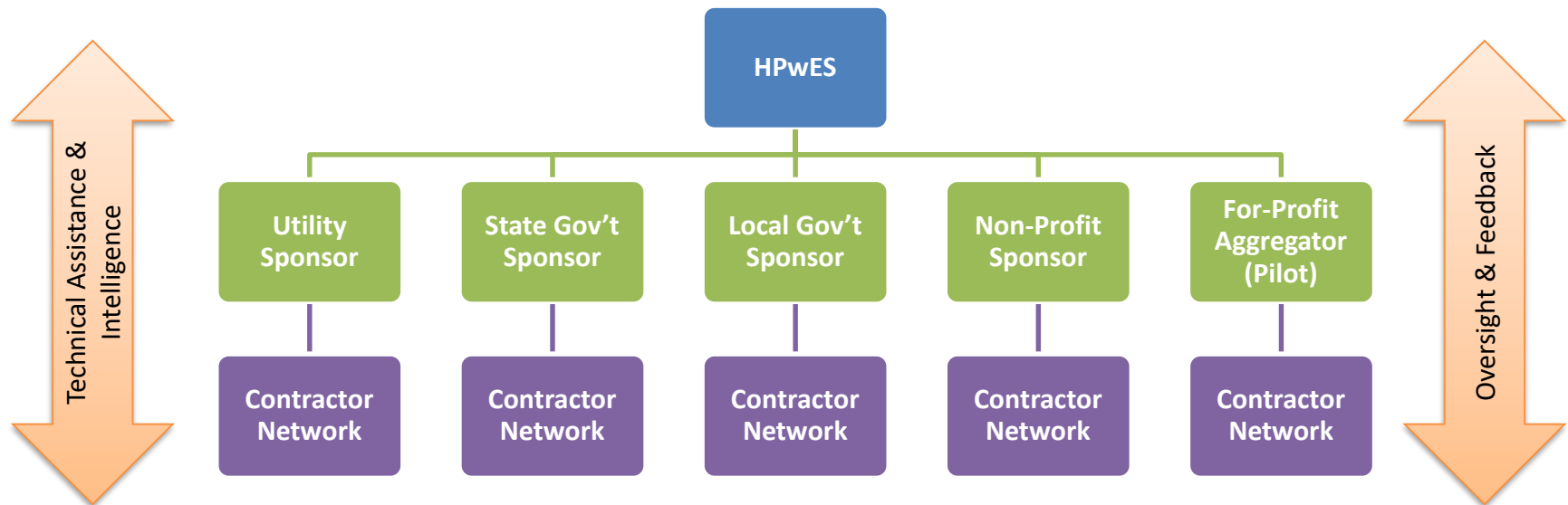
# 2016 Annual Report

## Home Performance with ENERGY STAR Program



Ely Jacobsohn, U.S. Dept of Energy  
Tyler Grubbs, CSRA

## U.S. Department of Energy & U.S. Environmental Protection Agency Cooperatively Manage Home Performance with ENERGY STAR

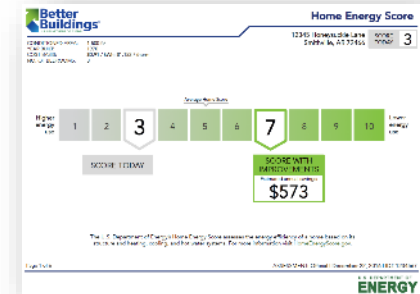


### The Home Performance with ENERGY STAR Approach



## Benefits for Sponsors

- Eligible to use the widely-recognized ENERGY STAR mark
- Recognition through the ENERGY STAR Partner of the Year Awards
- Account Manager and Technical Assistance
- Participate in HPwES Regional Collaboratives, working groups and conferences
- Facilitated access to DOE, EPA, & HUD Program resources including:
  - Better Buildings Residential Network
  - Building America
  - Weatherization Assistance Program & Workforce Guidelines
  - Home Energy Score
  - EPA - ENERGY STAR
  - EPA - Indoor airPlus
  - HUD - Federal Housing Administration
  - HUD – Office of Community Planning and Development



## Importance of the ENERGY STAR Brand



91%

of households recognized the ENERGY STAR label when shown the label

75%

of households had a high understanding of the ENERGY STAR label

# Strategies to Grow



Increase and Enhance Partnerships



Expand Outreach and Marketing



Improve Operational Excellence



Integrate R&D to Enhance the Value Proposition



Enhance Stability and Certainty in the Market



# Expanding Applicability of HPwES



Whole-House  
Multiple Measure  
Programs



Incremental  
Programs-HVAC



Multi-Family  
Programs



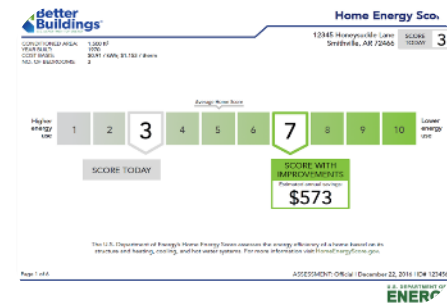
Affordable/Low  
Income Programs



Renewable  
Programs



Health and Home  
Performance  
Programs



Home Energy Score

# Technology Advances in HPwES Over Past 5-7 Years

## Measures and Technology

- Direct install measures transitioned from CFLs to LED lighting, and installation of smart energy powerstrips
- Eligible measures include smart thermostats, condensing and solar water heating (NJ)
- Technology includes Bluetooth® connected HVAC sensors, geotagging of digital images with cloud storage for quality control, use of smart thermostats for diagnostics, air quality monitors to sell and verify projects

## Data and Processes

- HPXML data definition/collection/transmission (Used in AZ, CA, LA, NY, OR, VA – IL and VT investigating)
- CRM use is critical for managing processes by Sponsors and Participating Contractors, field data is integrated into CRM using proprietary or off-the-shelf databases (examples include EnHabit's Threshold and Salesforce)
- Effort underway to link HEScore with HPwES reporting for Partners running both DOE programs

## Program Implementation Innovations

- Dashboards used to flag issues, show contractor ratings, and manage business processes
- API use to facilitate data collection and device communication between platforms
- "Pay for Performance" and M&V 2.0 energy savings measurement methods enable faster measurements with known confidence
- Link energy efficiency to home value using branded Certificates of Completion and Home Energy Score

# Emerging Opportunities

## Multifamily (4% of Projects)



9 Sponsors

3,204 projects

## Income-Targeted (16% of Projects)

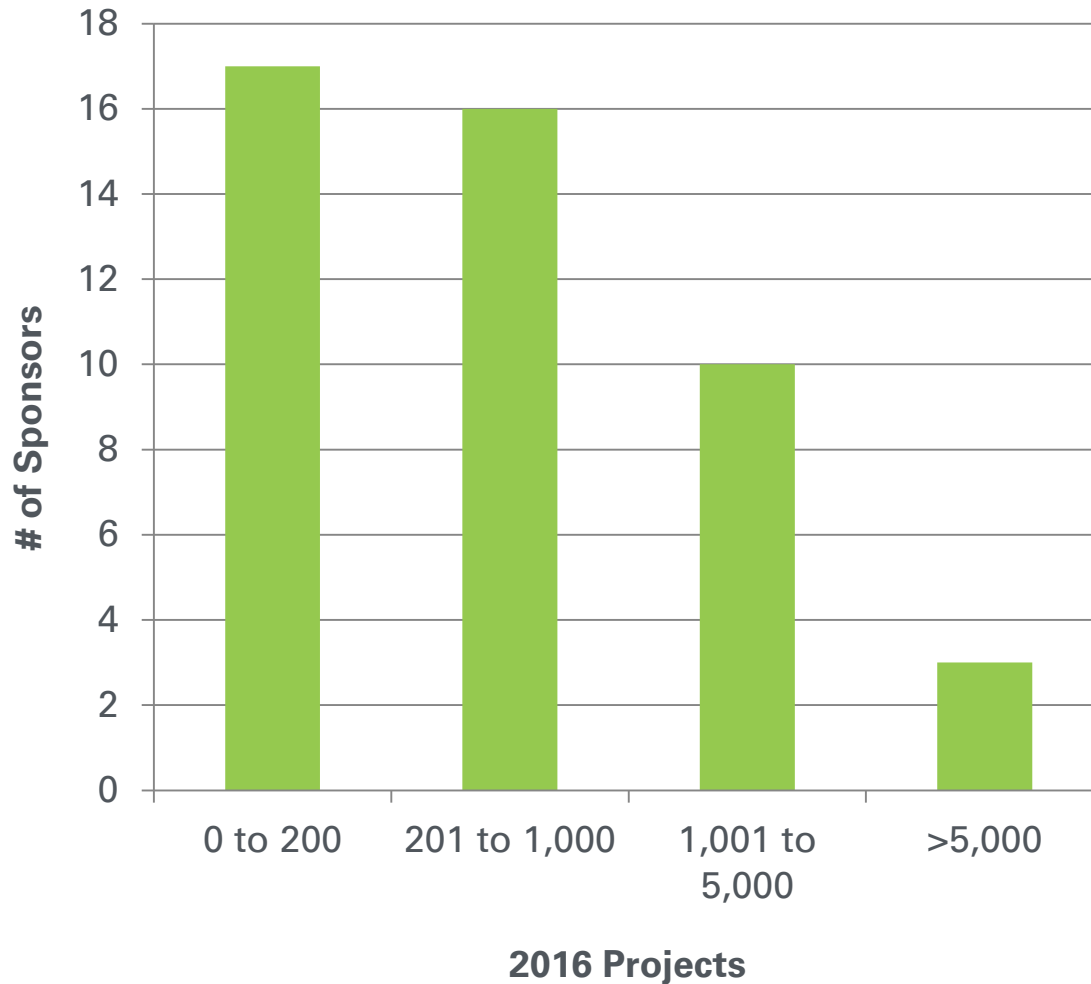


10 Sponsors

13,061 units



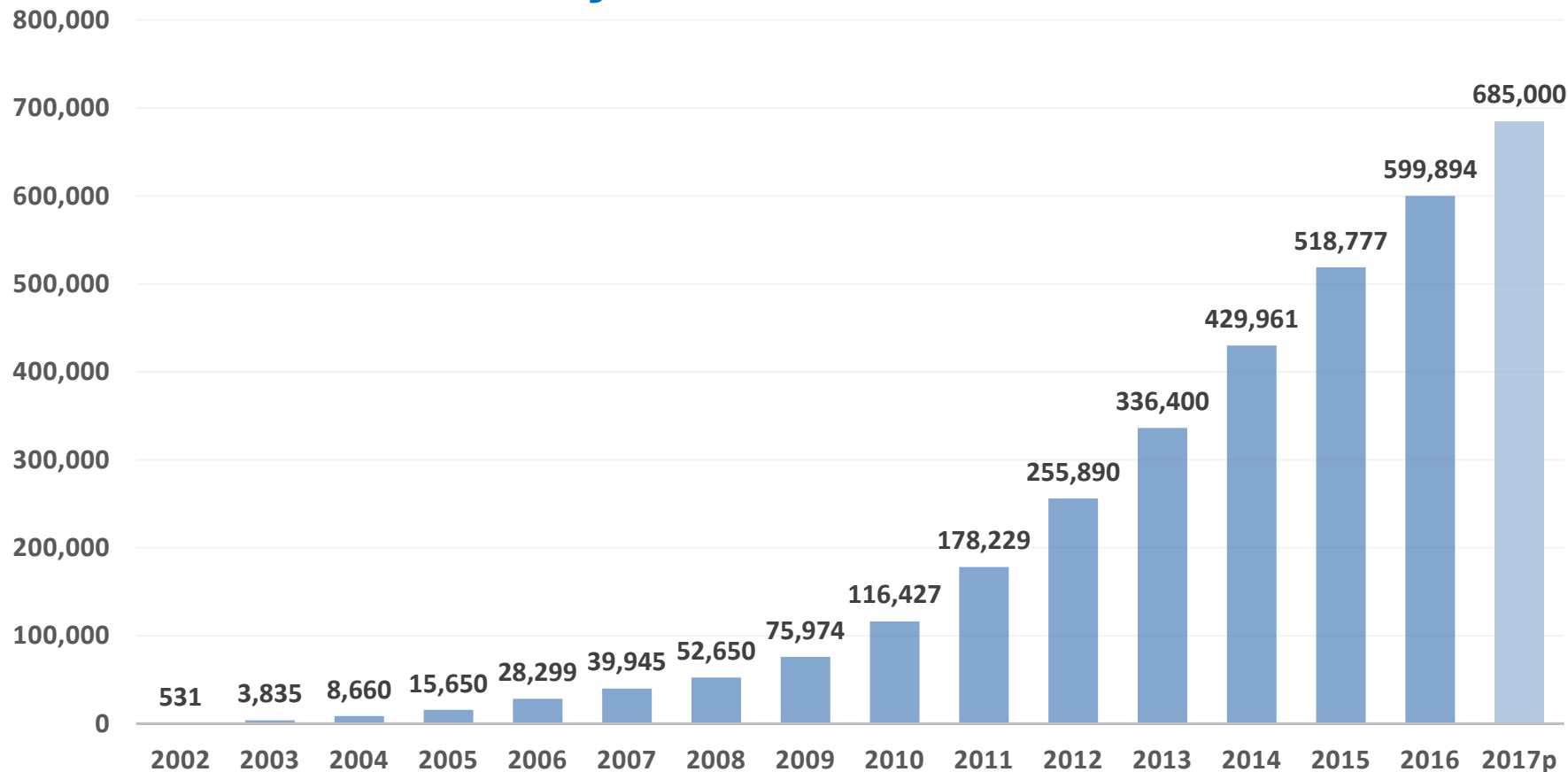
## Projects Completed



- 46 Sponsors completed a total of 81,204 projects\* during 2016.
- Over 600,000 projects completed since program inception – equivalent to retrofitting all of the homes in Philadelphia.

***\* A completed project is counted for each independent contract executed between a homeowner and a qualified participating contractor which meets all program requirements.***

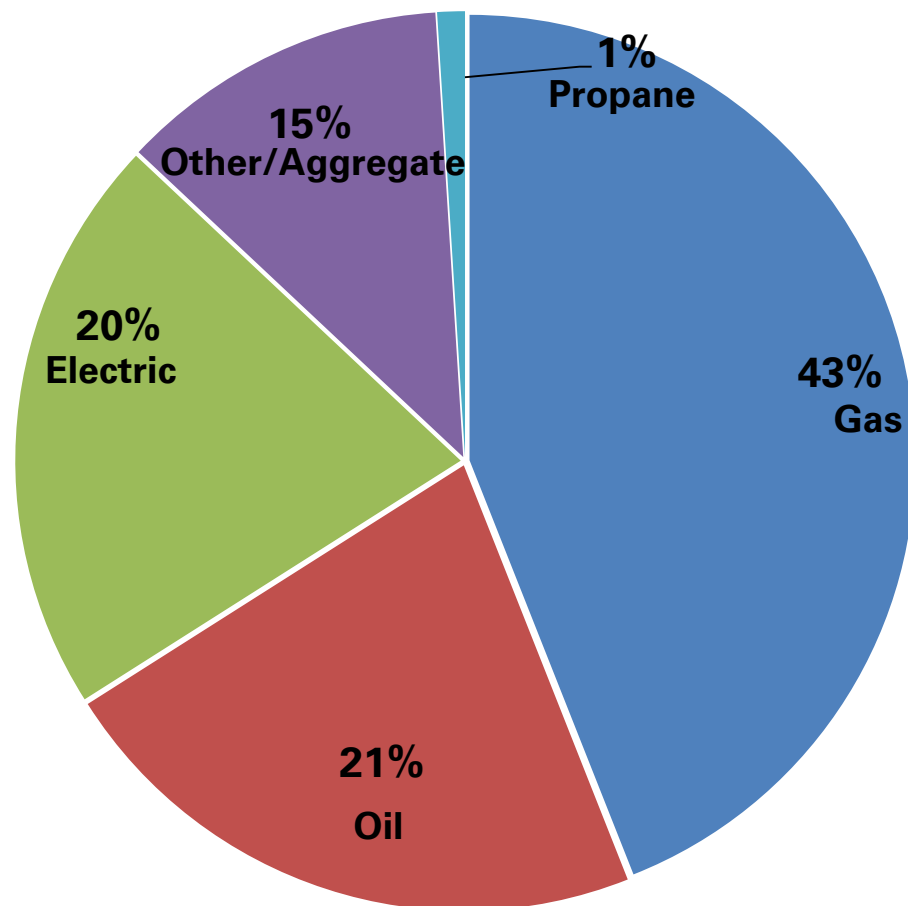
## Projects Since 2002



**Over 600,000 Projects!**

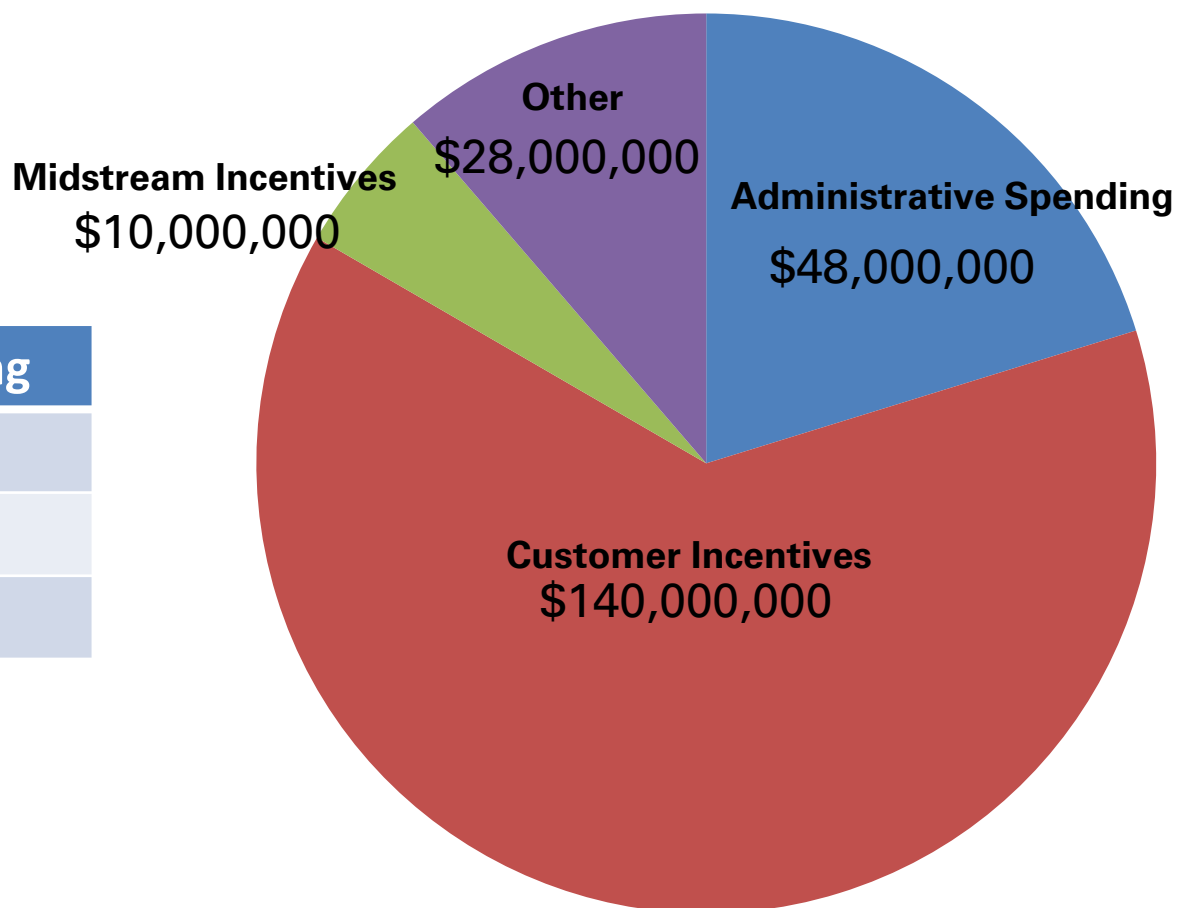
## Total Annual Energy Savings as Reported by Sponsors (N=38)

Year	N	MMBtu Savings
2014	40	2.1 million
2015	37	1.4 million
2016	38	1.7 million



## Total Program Spending as Reported by Sponsors (N=39)

Year	N	Spending
2014	42	\$290m
2015	39	\$190m
2016	39	\$230m



*Program costs: estimated lifetime \$/kWh saved of between 3 and 4 cents based on 2016 Sponsor program spending and fuel prices.*

# Workforce





## Most Active Trades in HPwES (N=43)

*The percentage of Sponsors indicating each trade as their most active workforce:*



Home Performance

74%



Insulation

16%



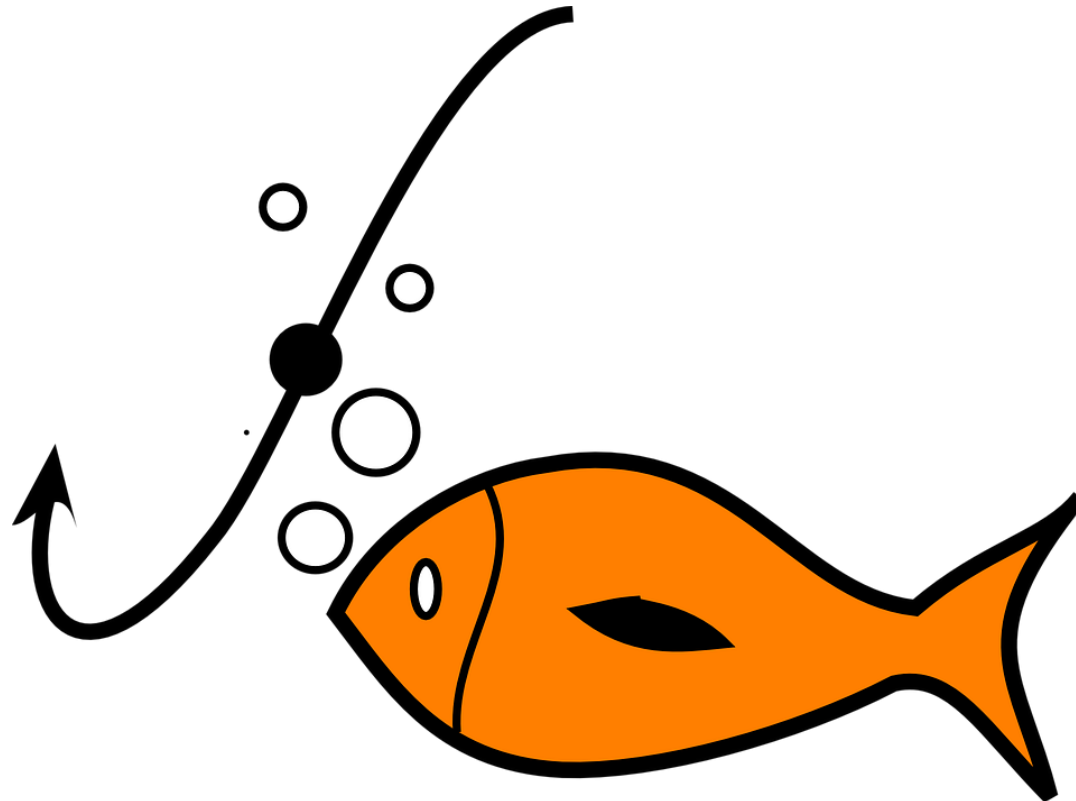
HVAC

10%

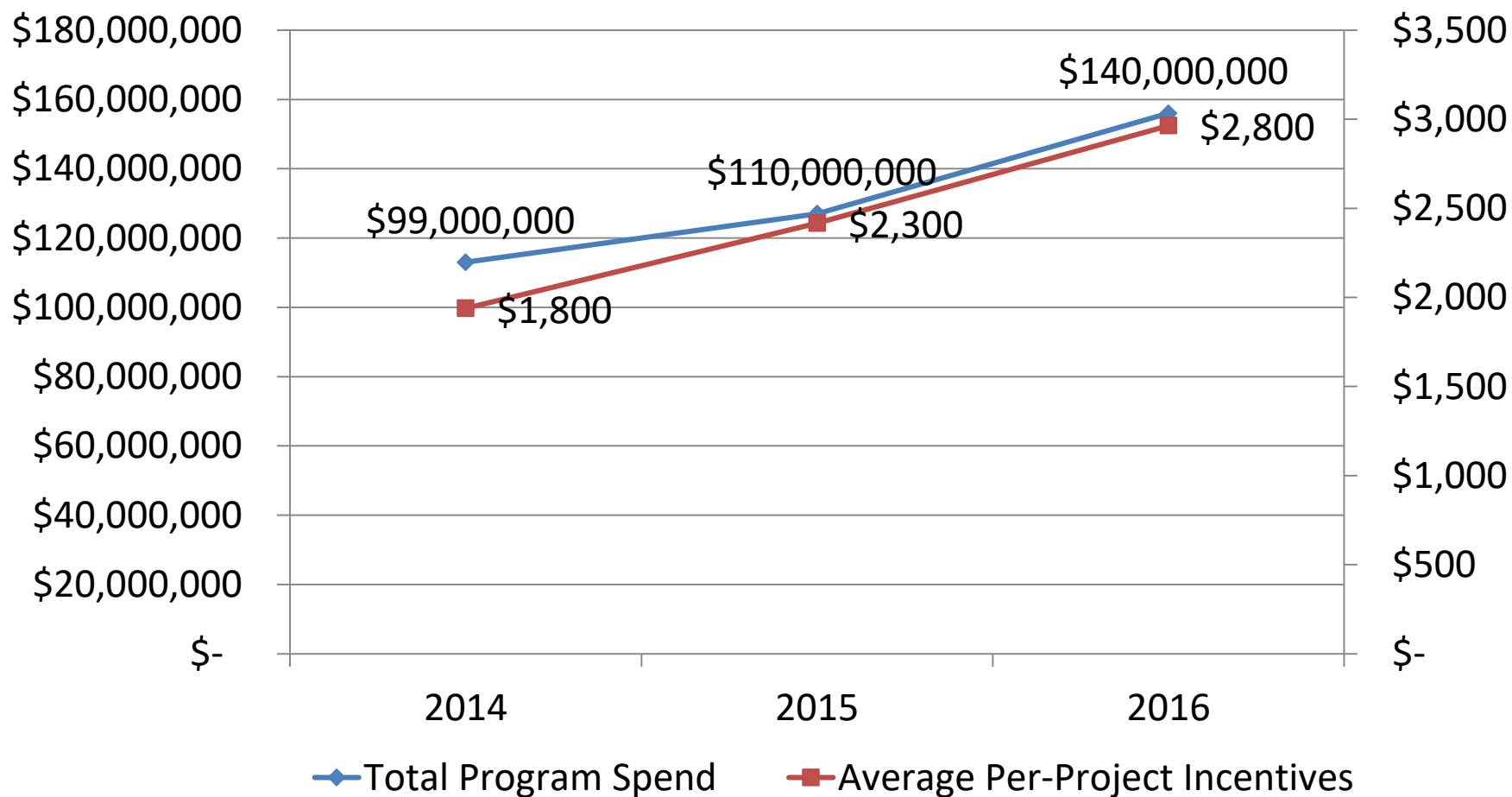
• 1,600 active contractors.

• 138 Century Club Winners completed 44% of 2016 projects.

# Customer Incentives



## Consumer Incentives Overview (N=35\*)



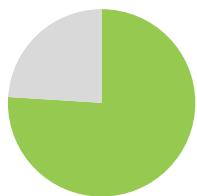
## Per-Project Spending on Consumer Incentives, by % of Sponsors

	2014 (N=40)	2015 (N=38)	2016 (N=41)
No Spending	15%	11%	15%
\$1 to \$1,000	35%	34%	24%
\$1,000 to \$1,999	20%	21%	29%
\$2,000 to \$2,999	23%	18%	15%
\$3,000 to \$3,999	5%	3%	10%
\$4,000 or more	2%	13%	7%

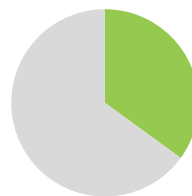
For Sponsors who spent money on incentives in 2016, the per-project average was \$2,800 (range \$8 to \$7,300). 6 Sponsors reported spending no money on customer incentives, and 3 Sponsors were unable to provide a figure.

## Customer Incentives Offered

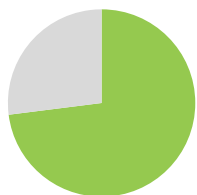
Among Sponsors who indicated offering customer incentives...



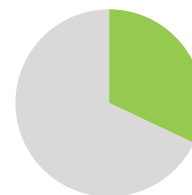
**76% offered discounted  
energy assessments**



**32% offered free energy  
assessments**



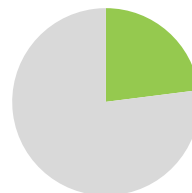
**73% offered measure-based  
rebates**



**29% offered project-based  
rebates**



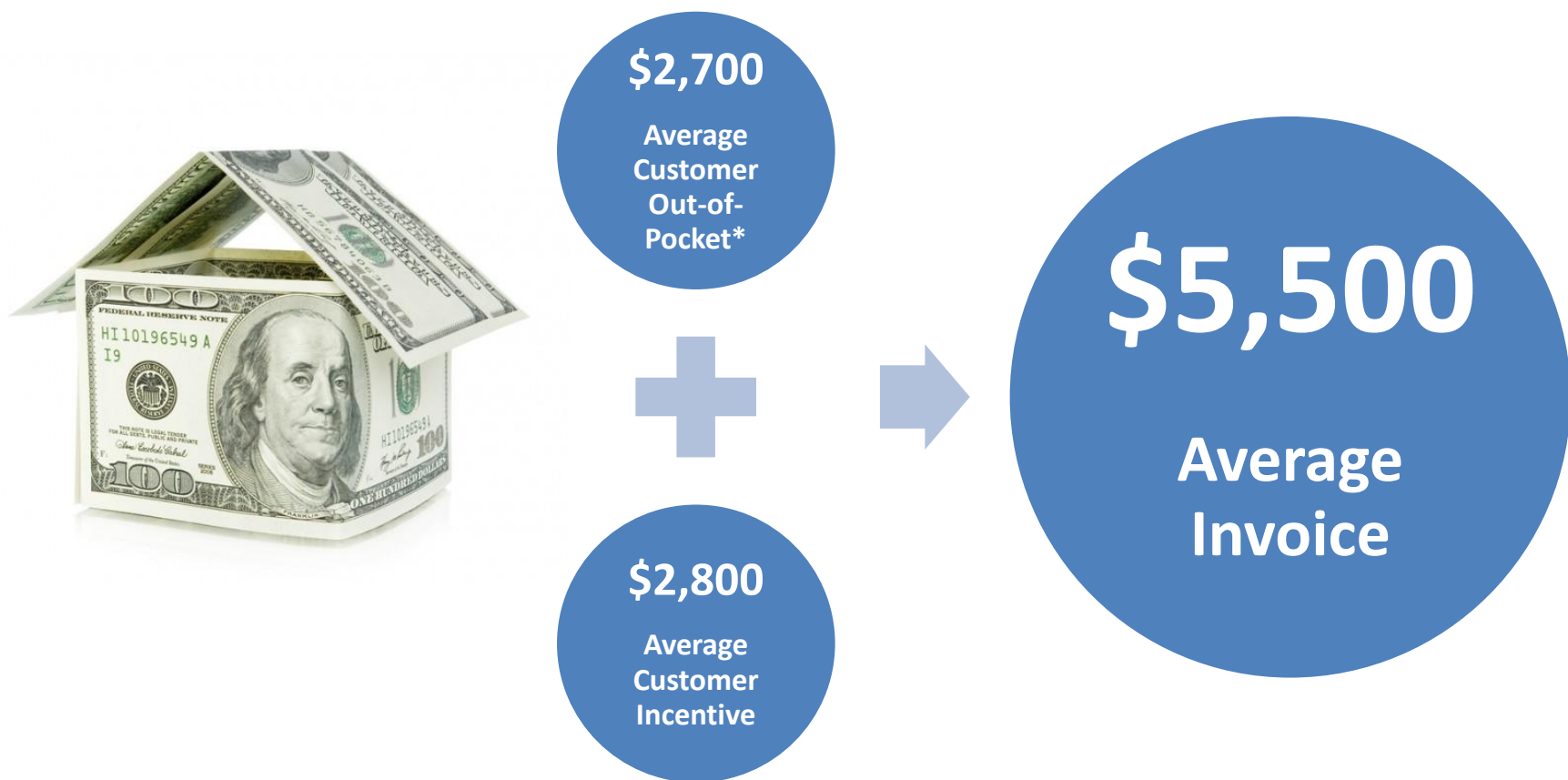
**39% - offered low-interest  
financing**



**24% offered on-bill  
Financing**



## Settling Up



Average Invoice N=37  
Average Customer Incentive N=35  
\*Calculated based on the other two figures

# Measure Mixes



## Project Measures

Percentage of Projects Completed with Each Measure (N=41)



**84% - Shell/envelope**



**21% - HVAC Replace**



**52% - Lighting**



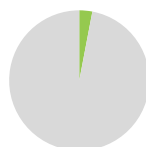
**10% - Water Heating**



**29% - Duct Sealing**



**8% - HVAC Repair**



**3% - Appliances**

# Quality Assurance



## Following Through: Quality Assurance

**\$400**

Average cost of one field inspection (N=38)

**\$150**

Average QA cost per project (N=35)

### Who Does QA? Sponsors say (N=43):

53% In-house  
19% Hybrid  
14% Contractor hired by program  
14% Independent 3<sup>rd</sup> party



## QA Inspection Points (N=44)

At how many points in the project timeline do Sponsors conduct QA? Options include: during the assessment, installation, test-out and post-installation.

**25%**

at 1  
point  
(31% of  
projects)

**30%**

at 2 points  
(16% of  
projects)

**7%**

at 3 points  
(1% of projects)

**39%**

at 4 points  
(52% of projects)

This graph indicates the number of stages that are reviewed during an on-site inspection. On-site inspections are not file reviews, though file reviews should be used to inform the on-site inspection process and be a part of the quality assurance plan.

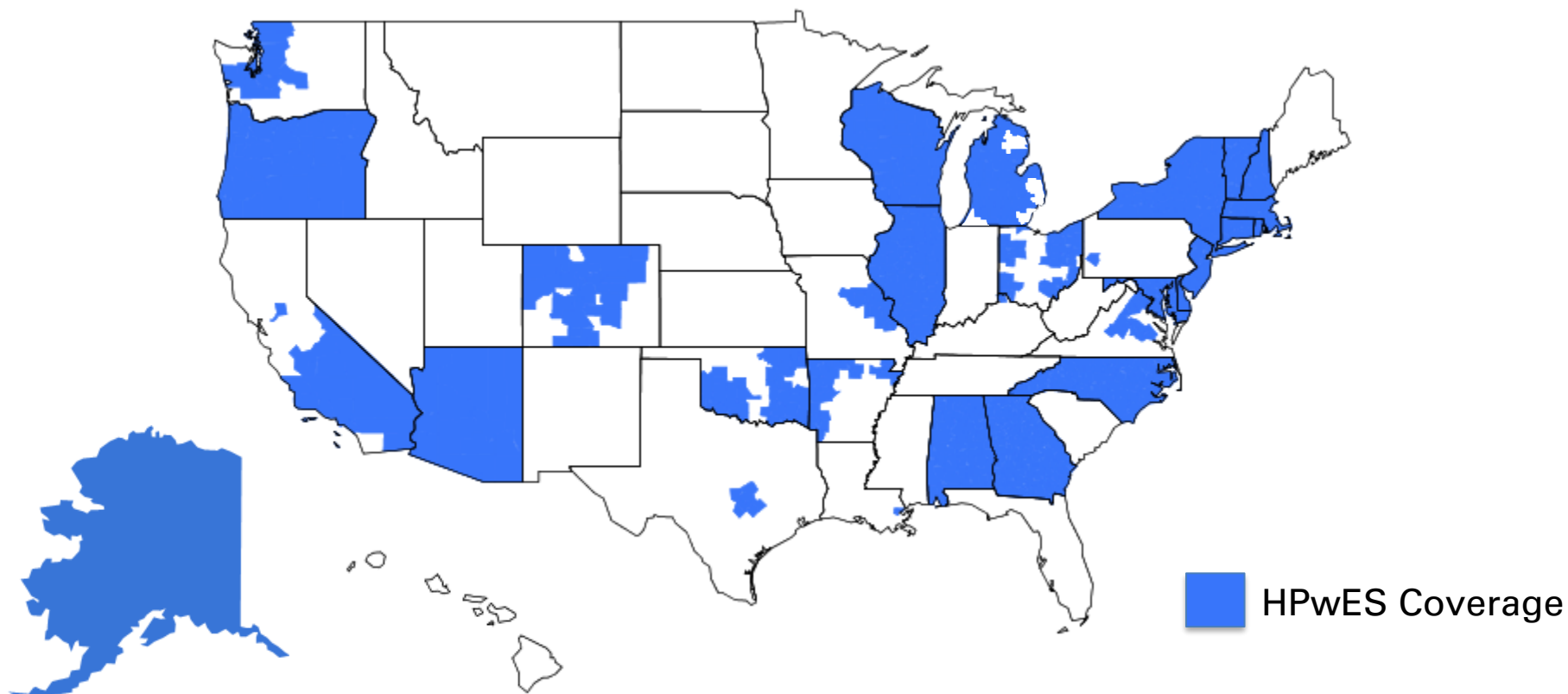
# Data Limitations

- Data is as reported by HPwES Sponsors.
- Follow the “N”. In an attempt to compare similar data, it was necessary to omit some Sponsors’ data from the analyses due to inconsistencies in it or how they defined the metric and/or answered the question. Unless otherwise stated, N=Number of Sponsors
- Apples-to-apples comparisons are complicated by differing reporting regimes and categorizations (see below).
- Program administrative costs represent a heterogeneous cross-section of sub-categories which may vary broadly from one sponsor to another; admin cost sub-categories may include any or all of the following: program administrator staff time and direct costs, implementation vendor staff time and direct cost, marketing, quality assurance, EM&V, or other miscellaneous program support costs.
- Energy savings data is calculated using predictive methods defined by each individual sponsoring program or state. Methods may include whole building energy simulations, modeled savings for individual measures or measure packages, deemed energy savings, or a combination. Underlying assumptions including baselines, effective useful life, and other key factors may vary significantly from one sponsor to another.
- Energy savings data is captured and reported only for the fuel types monitored by each sponsor. As a result, not all fuel savings attributable to Home Performance with ENERGY STAR will be represented in this data set.
- All per-project averages are weighted by Sponsor project count unless otherwise indicated.
- Sponsors may define and incentivize low- and mid-income projects differently, with attendant differences in other reported figures.

# **2016 Annual Report – Regional Data**

## **Home Performance with ENERGY STAR Program**

## 2016 HPwES Sponsor Territory Coverage



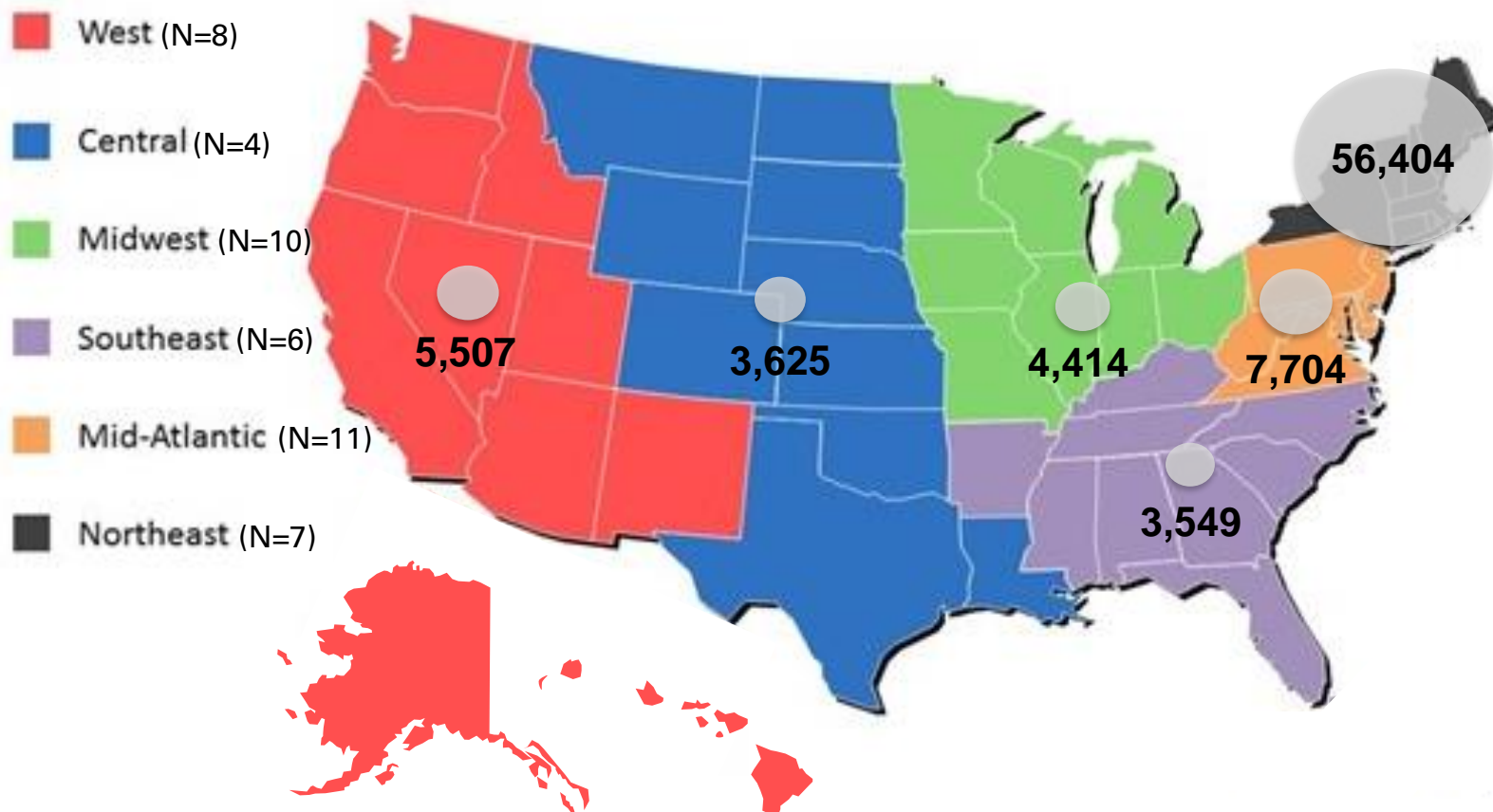
## 2016 HPwES Sponsors by NASEO\* Region

<b>Northeast</b>	Energize Connecticut, New York State Energy Research and Development Authority, Public Service of New Hampshire, Efficiency Vermont, PSEG Long Island, National Grid Rhode Island, National Grid Massachusetts
<b>Central</b>	Entergy New Orleans, Public Service Company of Oklahoma, Austin Energy, Xcel Energy Colorado
<b>Mid-Atlantic</b>	New Jersey Board of Public Utilities, Baltimore Gas & Electric, Delaware Sustainable Energy Utility, Potomac Edison, Southern Maryland Electric Cooperative, DC Sustainable Energy Utility, Delmarva, Richmond Regional Energy Alliance, Conservation Consultants, Inc., Pearl Certification
<b>Midwest</b>	Focus on Energy, Dominion East Ohio, Consumers, Columbia Water & Light, Xcel Energy Minnesota, Greater Cincinnati Energy Alliance, Illinois Home Performance with ENERGY STAR, EarthWays, Empower
<b>Southeast</b>	Jackson Electric Membership Corporation, Southwestern Electric Power Company, Black Hills Energy Arkansas, Nexus, Advanced Energy, Southface
<b>West</b>	FSL Home Improvement, SoCal Gas, Alaska Housing Finance Corporation, Southern California Edison, Enhabit, Energy Trust of Oregon, Puget Sound, Efficiency First California

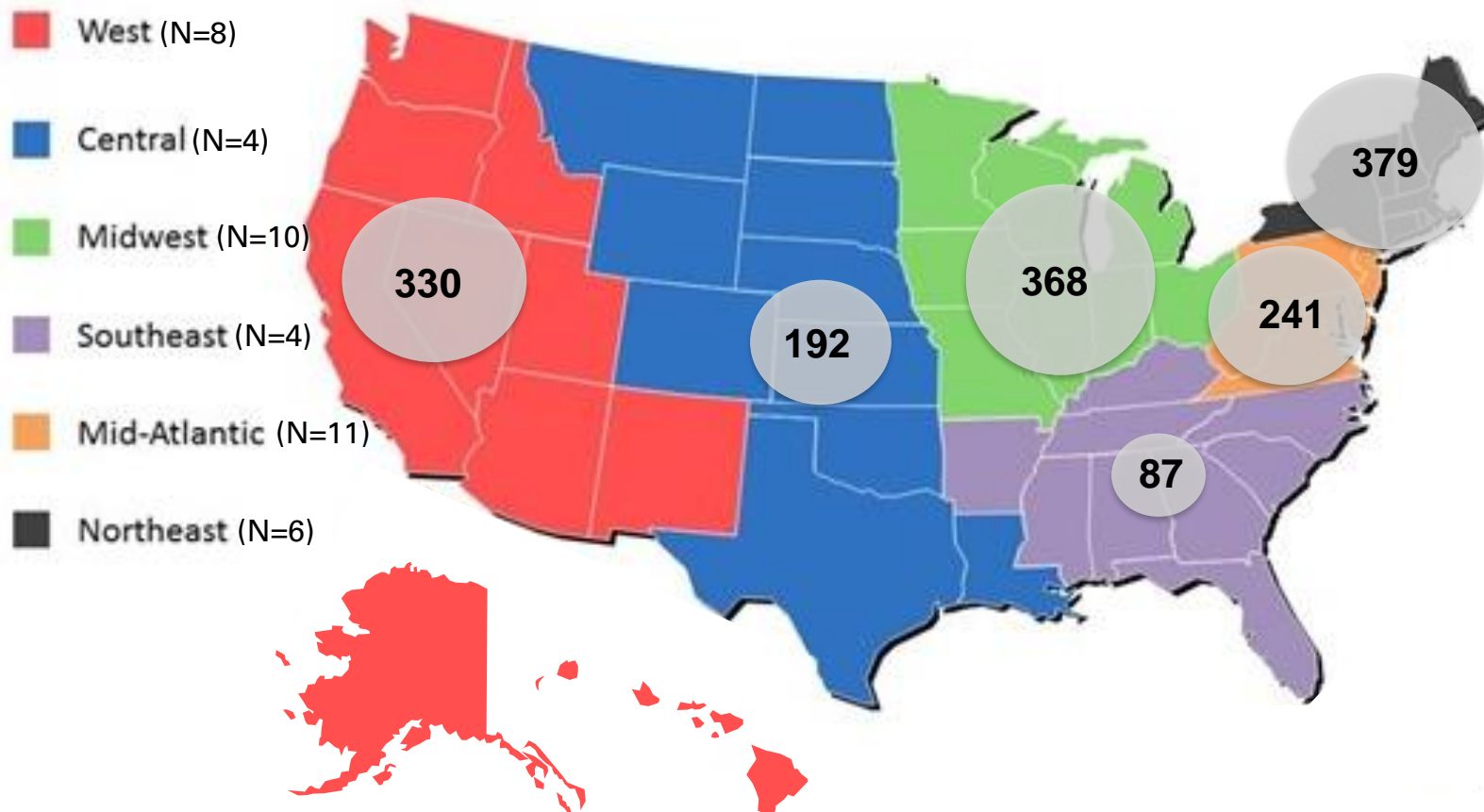
\* NASEO = National Association of State Energy Officials



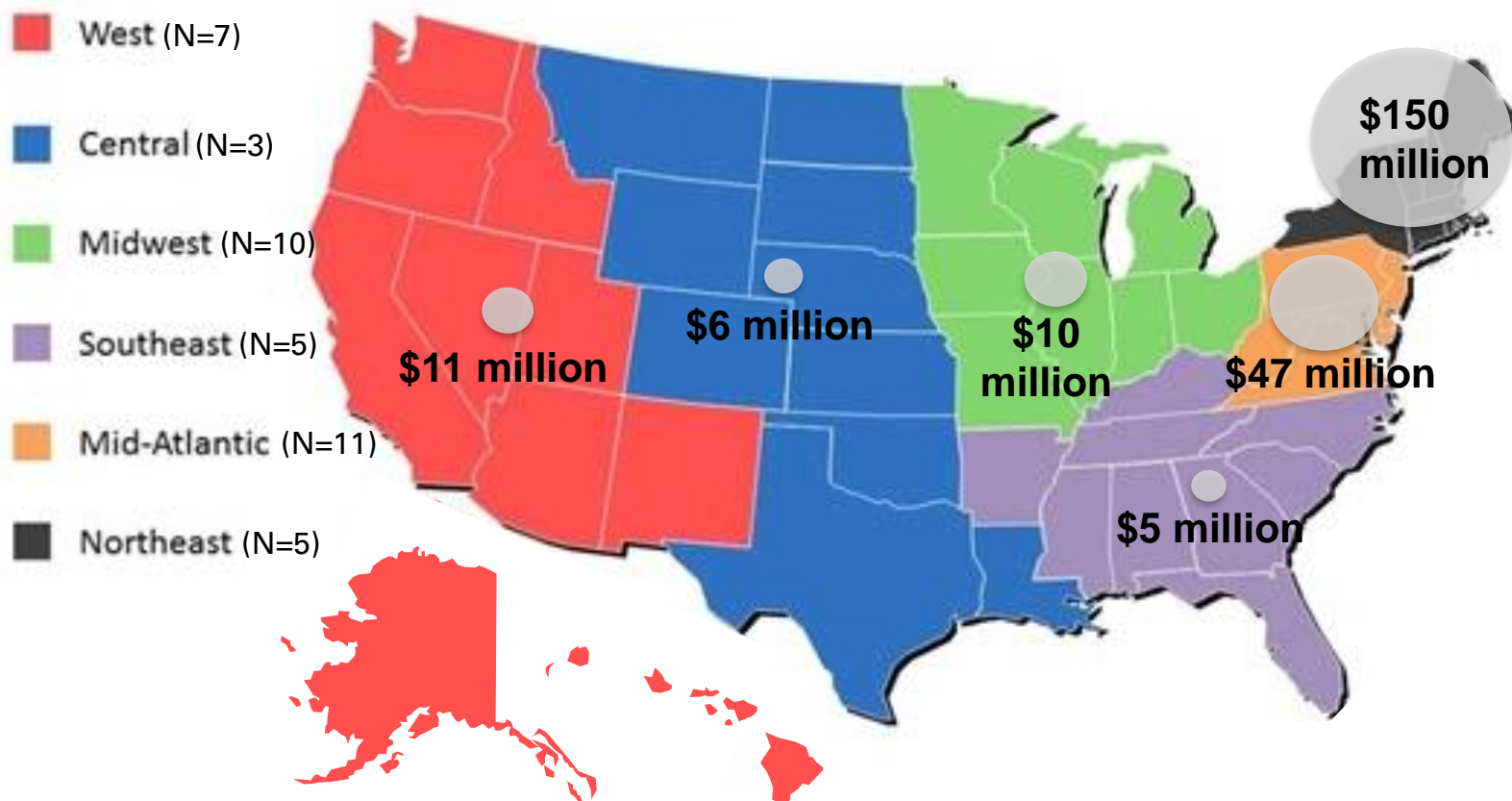
## 2016 Projects by Region (81,204 Total; N=46)



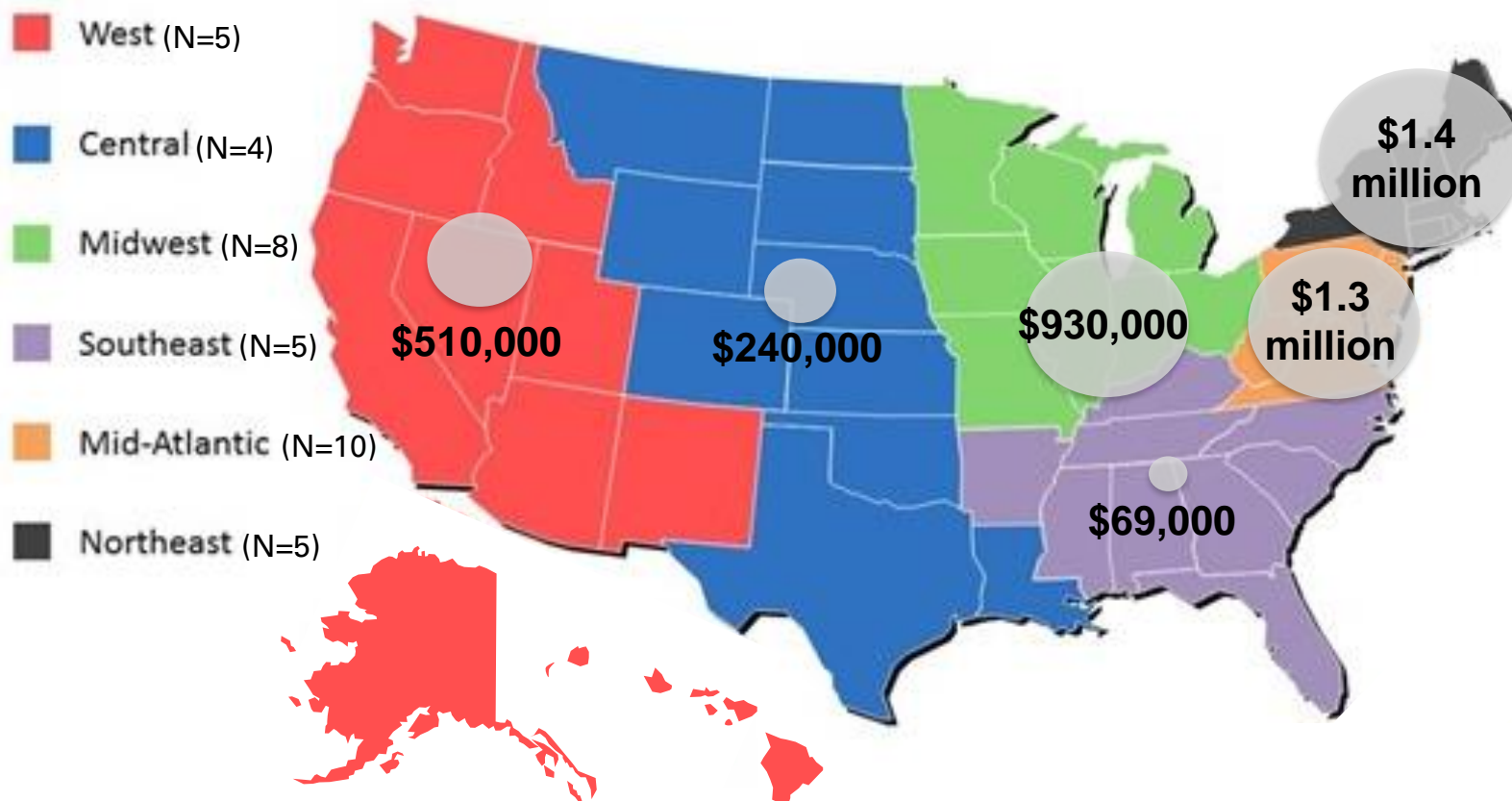
## Active Contractors by Region (1,600 total; N=43)



## 2016 Total Program Spending by Region (\$230 million total; N=40)

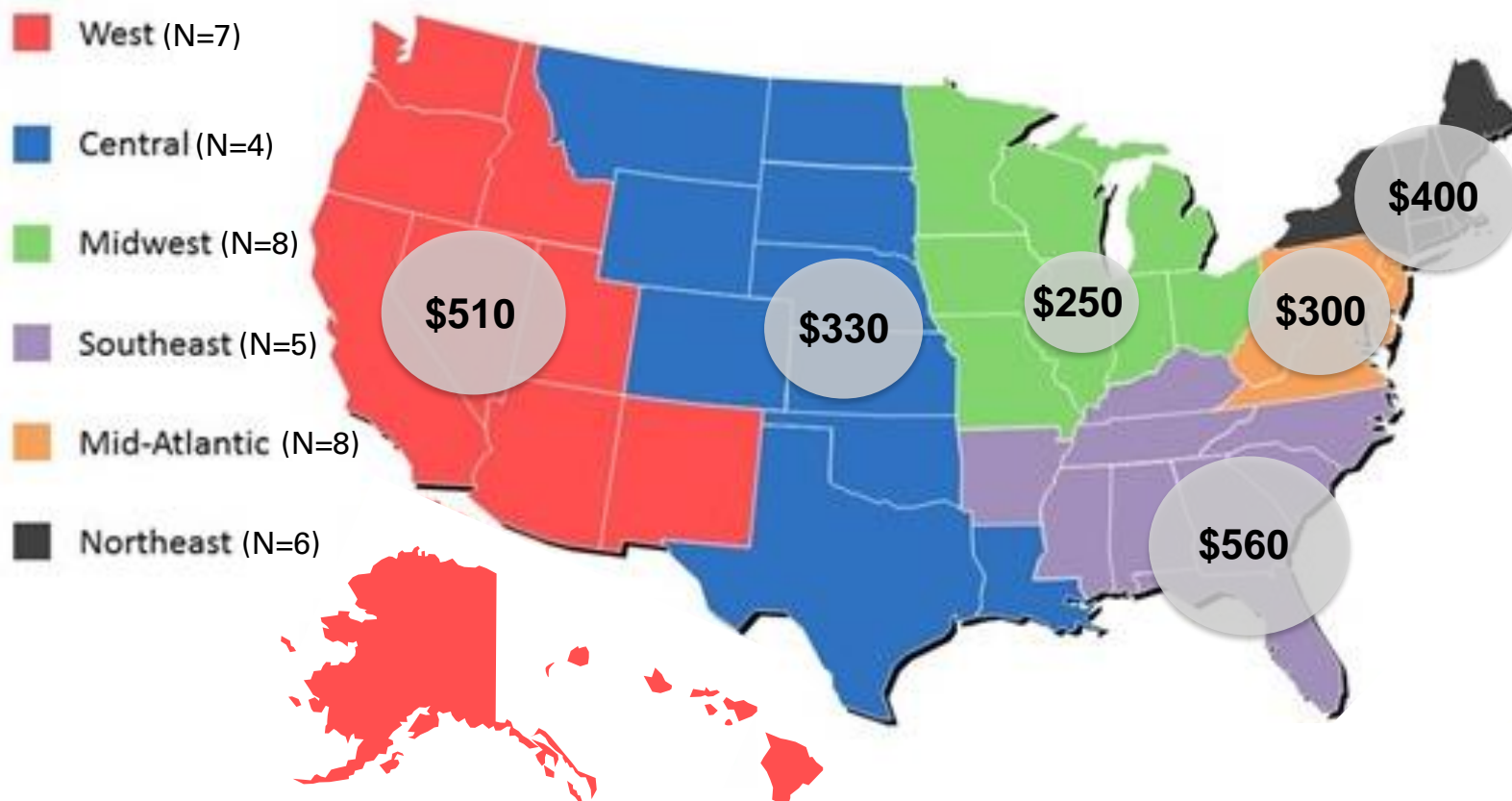


## 2016 Total Marketing Spend by Region (\$4.4 million total; N=38)

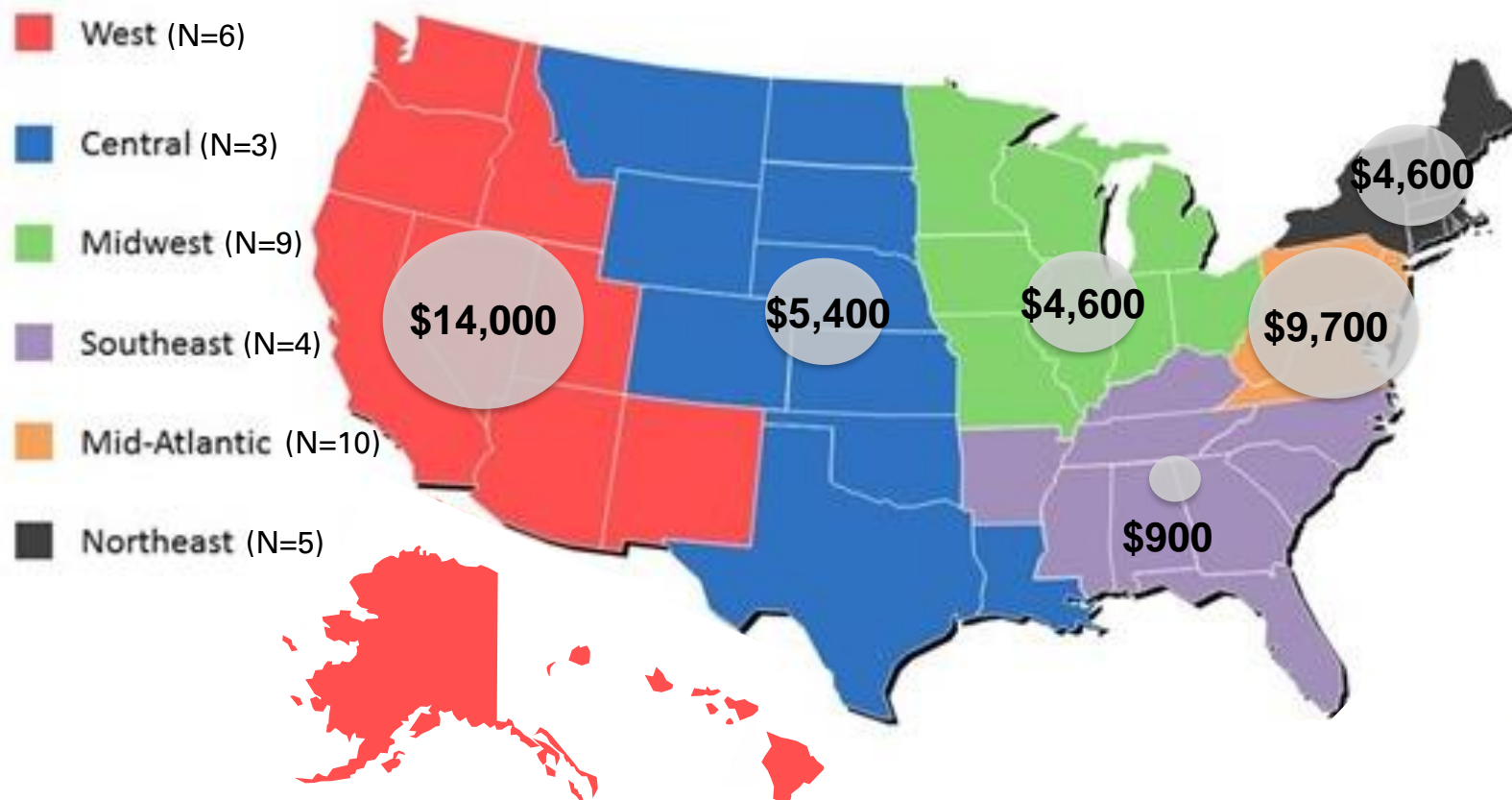




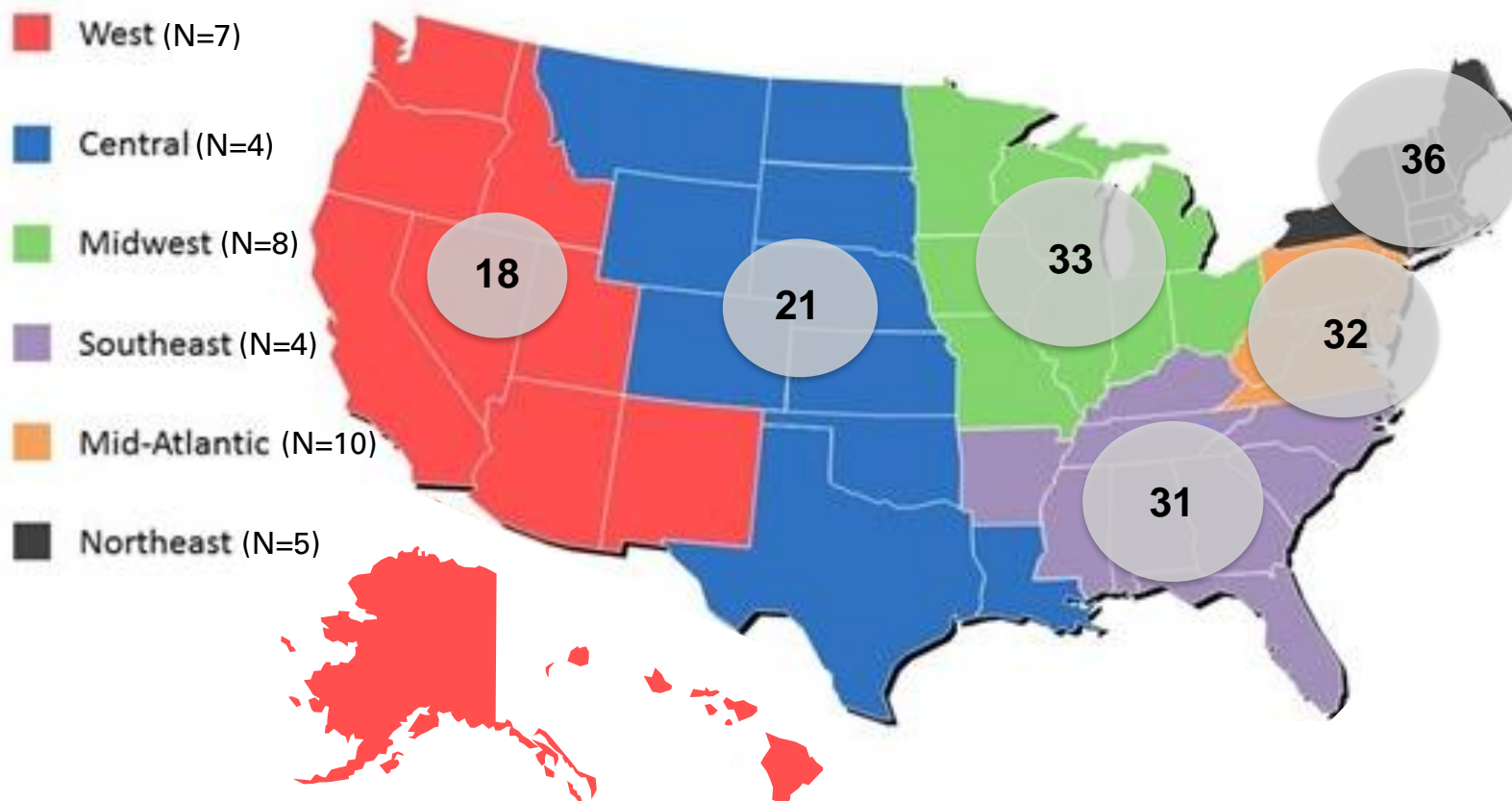
## 2016 Average Field Inspection Cost by Region (N=38)



## 2016 Average Project Invoice Cost by Region (N=37)

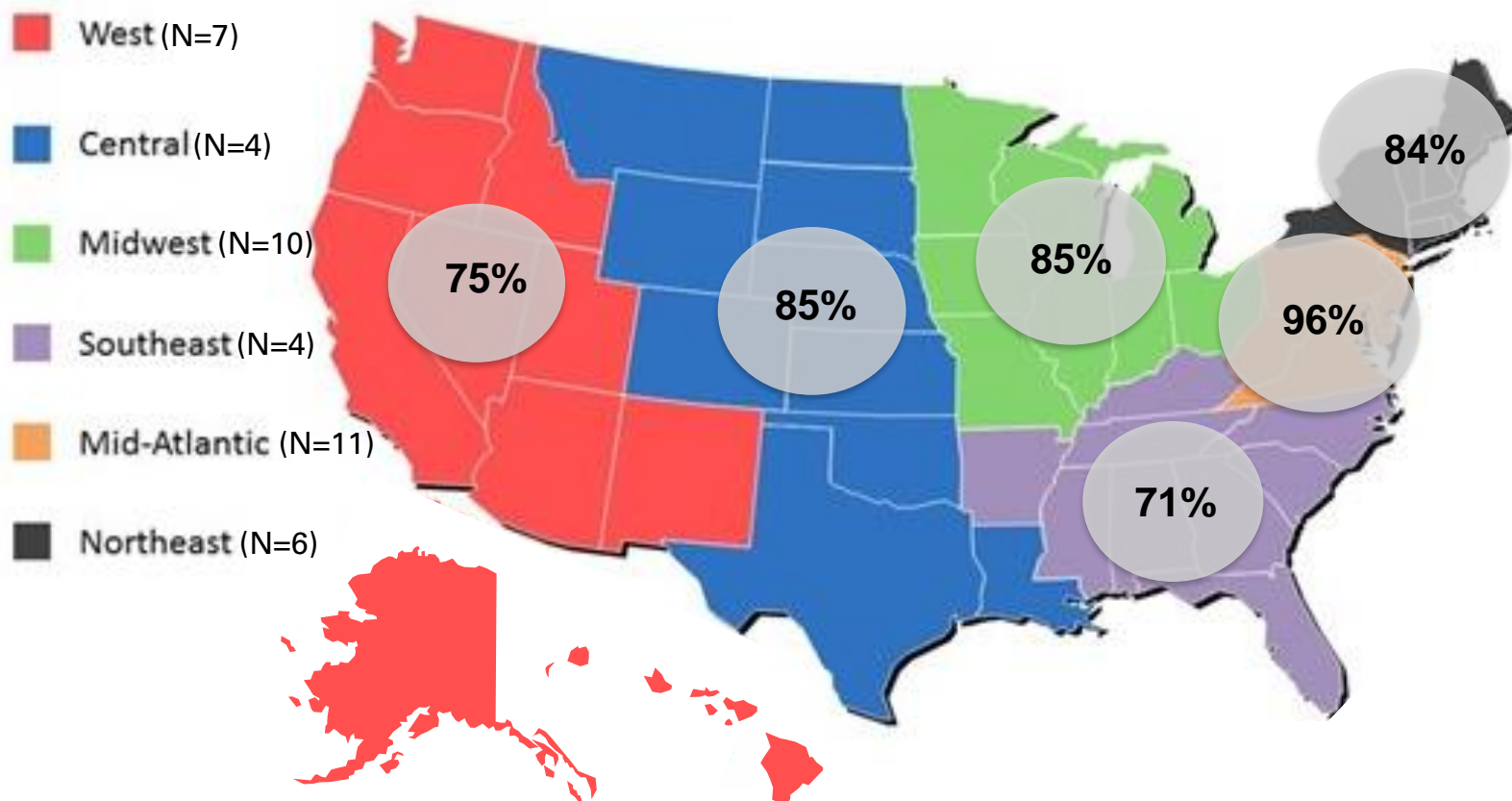


## 2016 Average Per-Project Energy Savings by Region (MMBtu; N=38)

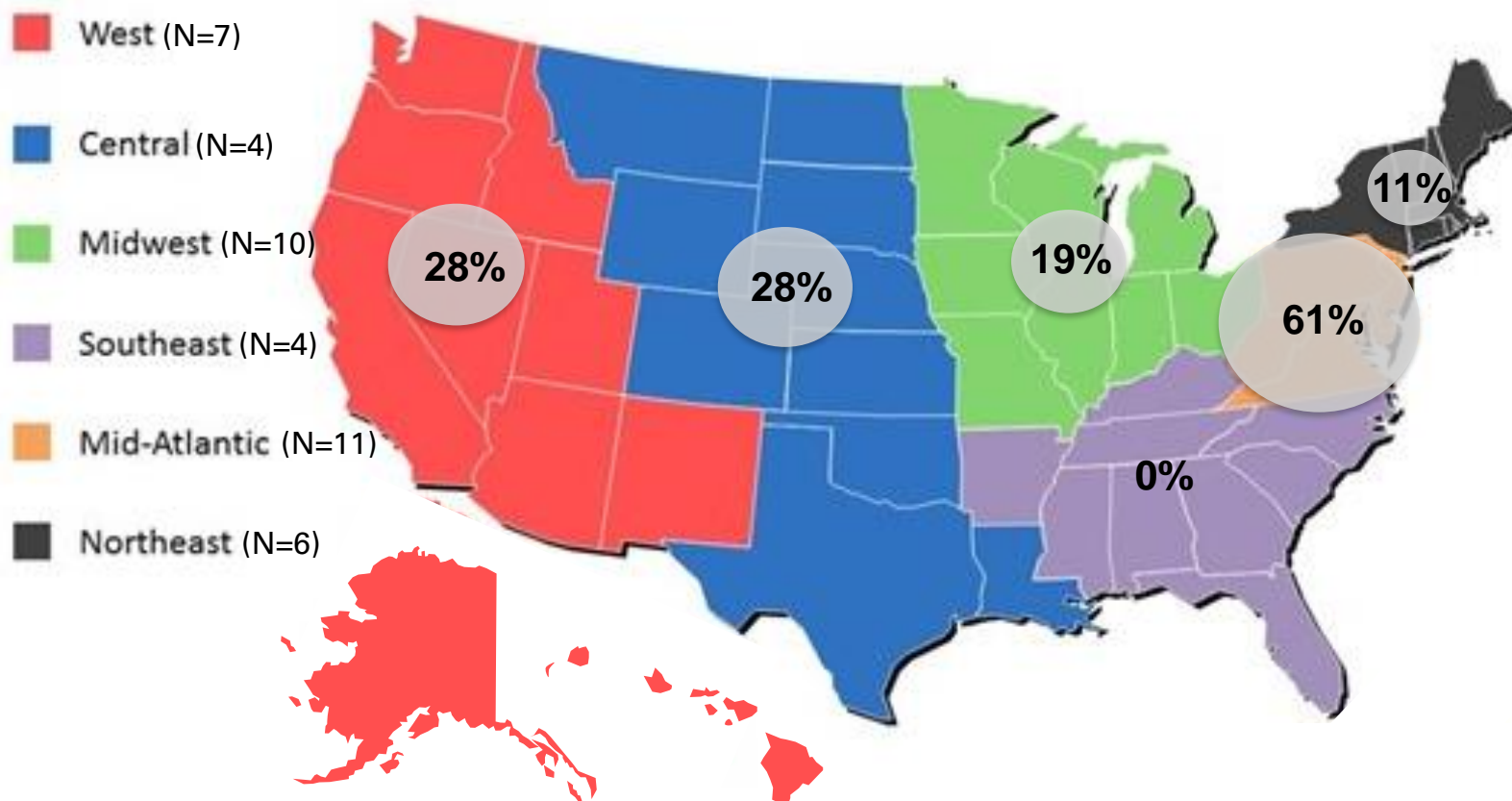




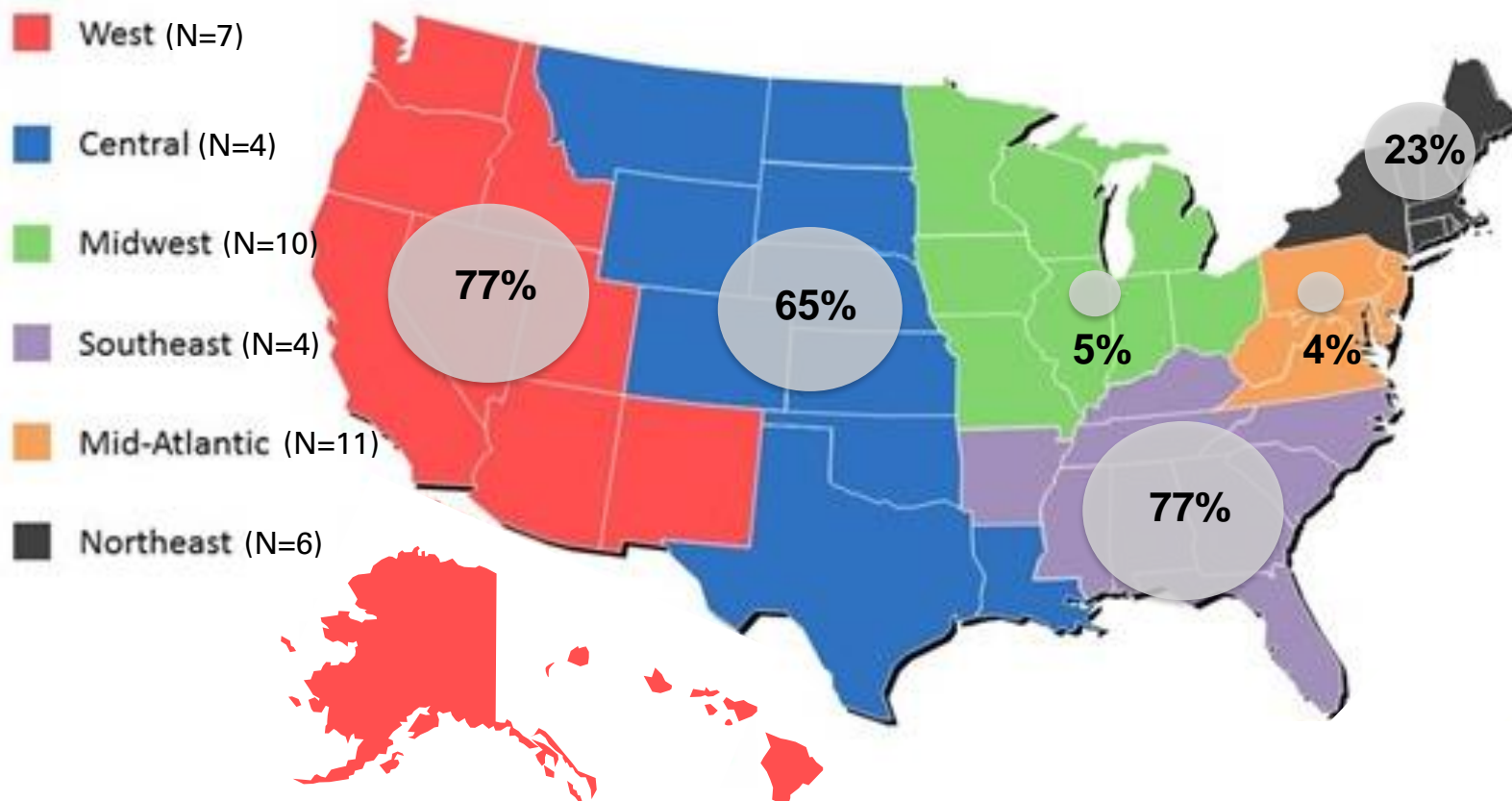
# 2016 % of Projects with Shell/Envelope Measures (N=41)



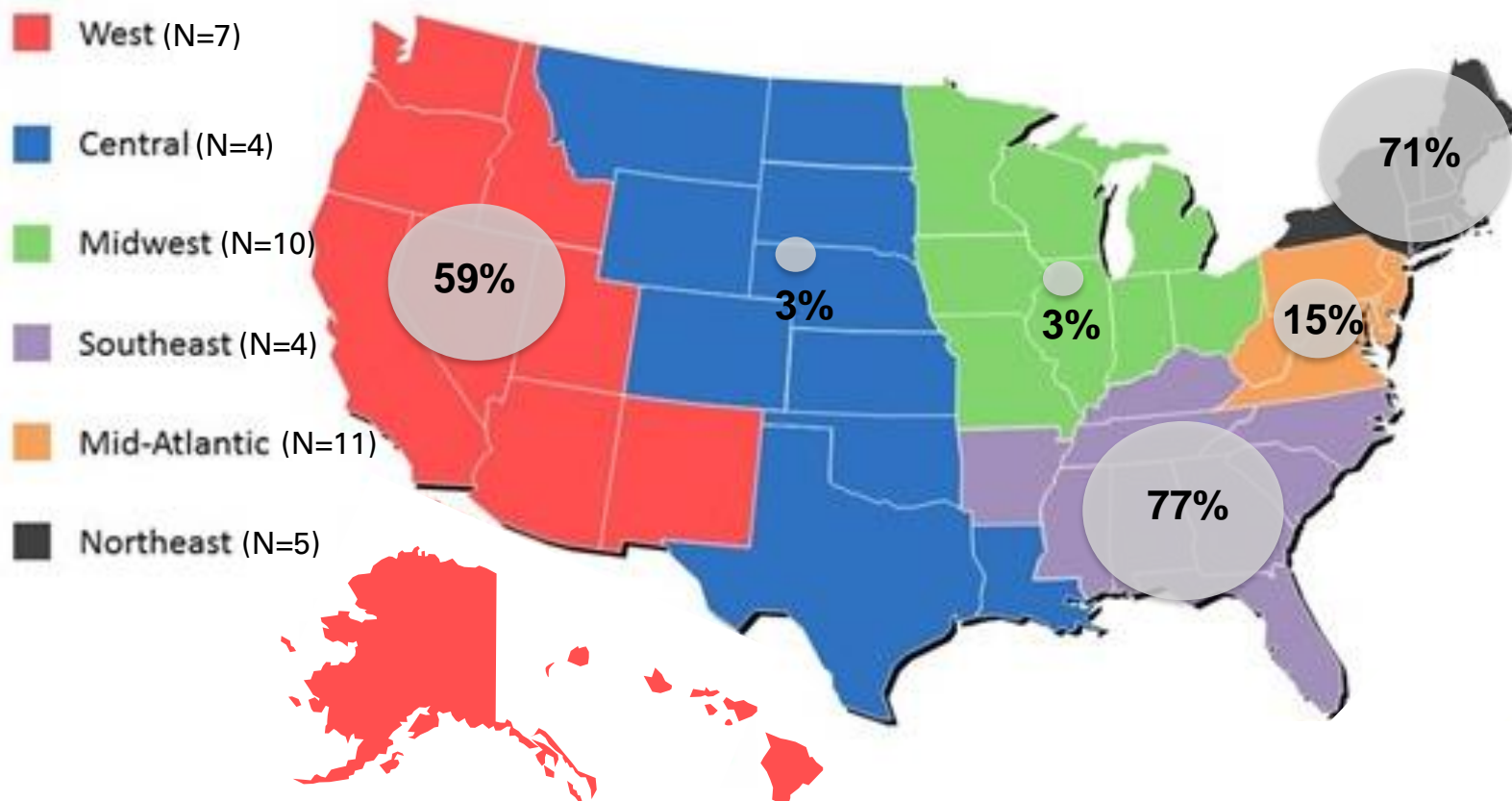
## 2016 % of Projects with HVAC Replacement Measures (N=41)



# 2016 % of Projects with Duct Sealing Measures (N=41)



## 2016 % of Projects with Lighting Measures (N=41)



# Annual Results: Western Region

	2014	2015	2016
<i>Sponsors</i>	5	6	8
<i>Projects</i>	3,805	3,902	5,507
<i>Administrative Spending</i>	\$2,100,000	\$910,000	\$5,700,000
<i>Customer Incentives Spending</i>	\$1,900,000	\$2,600,000	\$5,500,000
<i>Midstream Incentives Spending</i>	\$340,000	\$81,000	\$140,000
<i>Total Program Spending</i>	\$4,300,000	\$3,600,000	\$11,000,000
<i>Administrative Spend/Project (wtdavg)</i>	\$1,700	\$1,200	\$1,800
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$1,500	\$1,900	\$1,800
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$280	\$110	\$46
<i>Total Program Spend/Project (wtdavg)</i>	\$3,600	\$2,600	\$3,700
<i>Avg. Invoice (wtdavg)</i>	\$6,400	\$14,000	\$14,000
<i>Total Energy Savings (MMBtu)</i>	54,000	41,000	73,000
<i>Energy Savings/Project (MMBtu; wtdavg)</i>	14	11	18
<i>Marketing Spending</i>	\$510,000	\$120,000	\$510,000
<i>Marketing Spend/Project (wtdavg)</i>	\$420	\$160	\$300
<i>Multifamily Projects</i>	NA	NA	2
<i>Low-Income Projects</i>	NA	NA	9
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$236	\$430	\$510



# Annual Results: Mid-Atlantic Region

	2014	2015	2016
<i>Sponsors</i>	11	9	11
<i>Projects</i>	9,449	9,455	7,704
<i>Administrative Spending</i>	\$9,000,000	\$8,500,000	\$7,000,000
<i>Customer Incentives Spending</i>	\$33,000,000	\$44,000,000	\$36,000,000
<i>Midstream Incentives Spending</i>	\$3,900,000	\$4,300,000	\$3,700,000
<i>Total Program Spending</i>	\$50,000,000	\$57,000,000	\$47,000,000
<i>Administrative Spend/Project (wtdavg)</i>	\$960	\$890	\$910
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$3,500	\$4,600	\$4,700
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$420	\$460	\$480
<i>Total Program Spend/Project (wtdavg)</i>	\$5,400	\$6,000	\$6,100
<i>Avg. Invoice (wtdavg)</i>	\$11,000	\$11,000	\$9,700
<i>Total Energy Savings (MMBtu; wtdavg)*</i>	260,000	270,000	250,000
<i>Energy Savings/Project (MMBtu; wtdavg)*</i>	28	29	32
<i>Marketing Spending</i>	\$400,000	\$1,400,000	\$1,300,000
<i>Marketing Spend/Project (wtdavg)</i>	\$62	\$150	\$160
<i>Multifamily Projects</i>	NA	NA	1249
<i>Low-Income Projects</i>	NA	NA	5
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$310	\$330	\$300

# Annual Results: Midwest Region

	2014	2015	2016
<i>Sponsors</i>	10	10	10
<i>Projects</i>	11,646	8,522	4,414
<i>Administrative Spending</i>	\$6,100,000	\$5,400,000	\$5,700,000
<i>Customer Incentives Spending</i>	\$7,600,000	\$6,400,000	\$4,400,000
<i>Midstream Incentives Spending</i>	\$560,000	\$400,000	\$310,000
<i>Total Program Spending</i>	\$14,000,000	\$12,000,000	\$10,400,000
<i>Administrative Spend/Project (wtdavg)</i>	\$530	\$660	\$1,300
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$660	\$780	\$1,000
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$49	\$48	\$71
<i>Total Program Spend/Project (wtdavg)</i>	\$1,200	\$1,500	\$3,100
<i>Avg. Invoice (wtdavg)</i>	\$4,100	\$4,100	\$4,600
<i>Total Energy Savings (MMBtu)</i>	330,000	200,000	140,000
<i>Energy Savings/Project (MMBtu; wtdavg)</i>	33	28	33
<i>Marketing Spending</i>	\$480,000	\$520,000	\$930,000
<i>Marketing Spend/Project (wtdavg)</i>	\$42	\$64	\$217
<i>Multifamily Projects</i>	NA	NA	1
<i>Low-Income Projects</i>	NA	NA	549
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$310	\$290	\$250



## Annual Results: Central Region

	2014	2015	2016
<i>Sponsors</i>	6	6	4
<i>Projects</i>	4,933	5,100	3,625
<i>Administrative Spending</i>	\$1,800,000	\$2,200,000	\$1,900,000
<i>Customer Incentives Spending</i>	\$6,900,000	\$8,000,000	\$4,500,000
<i>Midstream Incentives Spending</i>	\$87,000	\$130,000	\$94,000
<i>Total Program Spending</i>	\$8,700,000	\$10,000,000	\$6,400,000
<i>Administrative Spend/Project (wtdavg)</i>	\$440	\$520	\$760
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$1,400	\$1,900	\$1,800
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$22	\$31	\$38
<i>Total Program Spend/Project (wtdavg)</i>	\$1,800	\$2,400	\$2,600
<i>Avg. Invoice (wtdavg)</i>	\$7,100	\$5,400	\$5,400
<i>Total Energy Savings (MMBtu)</i>	94,000	140,000	78,000
<i>Energy Savings/Project (MMBtu; wtdavg)</i>	21	28	21
<i>Marketing Spending</i>	\$180,000	\$530,000	\$240,000
<i>Marketing Spend/Project (wtdavg)</i>	\$44	\$120	\$67
<i>Multifamily Projects</i>	NA	NA	102
<i>Low-Income Projects</i>	NA	NA	420
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$330	\$420	\$330

# Annual Results: Northeast Region

	2014	2015	2016
<i>Sponsors</i>	7	7	7
<i>Projects</i>	61,507	26,942	56,404
<i>Administrative Spending</i>	\$16,000,000	\$16,000,000	\$26,000,000
<i>Customer Incentives Spending</i>	\$48,000,000	\$50,000,000	\$87,000,000
<i>Midstream Incentives Spending</i>	\$5,400,000	\$4,700,000	\$5,500,000
<i>Total Program Spending</i>	\$208,000,000	\$102,000,000	\$146,000,000
<i>Administrative Spend/Project (wtdavg)</i>	\$613	\$680	\$870
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$1,800	\$2,100	\$3,000
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$200	\$180	\$190
<i>Total Program Spend/Project (wtdavg)</i>	\$3,600	\$4,300	\$5,000
<i>Avg. Invoice (wtdavg)</i>	\$5,600	\$5,700	\$4,600
<i>Total Energy Savings (MMBtu)</i>	1,400,000	730,000	1,100,000
<i>Energy Savings/Project (MMBtu; wtdavg)</i>	24	31	36
<i>Marketing Spending</i>	\$2,700,000	\$1,100,000	\$1,400,000
<i>Marketing Spend/Project (wtdavg)</i>	\$100	\$48	\$47
<i>Multifamily Projects</i>	NA	NA	907
<i>Low-Income Projects</i>	NA	NA	11,924
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$440	\$460	\$400

# Annual Results: Southeast Region

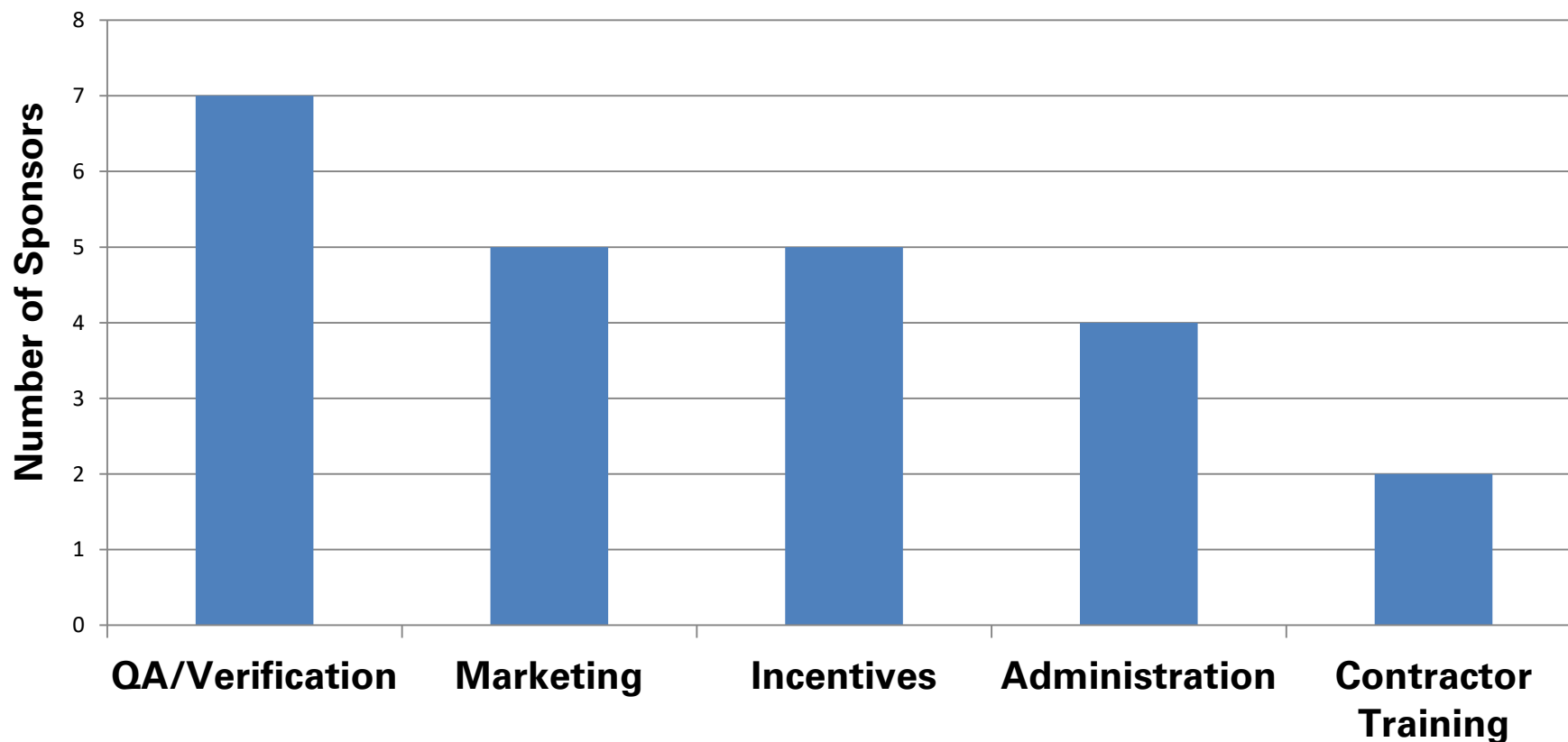
	2014	2015	2016
<i>Sponsors</i>	8	7	6
<i>Projects</i>	1,930	1,975	3,549
<i>Administrative Spending</i>	\$1,300,000	\$710,000	\$1,900,000
<i>Customer Incentives Spending</i>	\$1,600,000	\$2,000,000	\$3,000,000
<i>Midstream Incentives Spending</i>	\$110,000	\$54,000	\$90,000
<i>Total Program Spending</i>	\$4,000,000	\$2,800,000	\$5,000,000
<i>Administrative Spend/Project (wtdavg)</i>	\$660	\$360	\$540
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$890	\$1,000	\$820
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$58	\$28	\$25
<i>Total Program Spend/Project (wtdavg)</i>	\$2,100	\$1,400	\$1,500
<i>Avg. Invoice (wtdavg)</i>	\$2,800	\$1,600	\$900
<i>Total Energy Savings (MMBtu)</i>	18,000	47,000	100,000
<i>Energy Savings/Project (MMBtu; wtdavg)</i>	11	25	31
<i>Marketing Spending</i>	\$170,000	\$37,000	\$69,000
<i>Marketing Spend/Project (wtdavg)</i>	\$86	\$18	\$20
<i>Multifamily Projects</i>	NA	NA	900
<i>Low-Income Projects</i>	NA	NA	150
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$170	\$190	\$560

## Annual Results: All Regions

	2014	2015	2016
<i>Sponsors</i>	48	45	46
<i>Projects</i>	93,561	88,816	81,204
<i>Administrative Spending</i>	\$36,000,000	\$34,000,000	\$48,000,000
<i>Customer Incentives Spending</i>	\$99,000,000	\$110,000,000	\$140,000,000
<i>Midstream Incentives Spending</i>	\$10,000,000	\$10,000,000	\$10,000,000
<i>Total Program Spending</i>	\$290,000,000	\$187,000,000	\$230,000,000
<i>Administrative Spend/Project (wtdavg)</i>	\$670	\$700	\$920
<i>Customer Incentives Spend/Project (wtdavg)</i>	\$1,800	\$2,300	\$2,800
<i>Midstream Incentives Spend/Project (wtdavg)</i>	\$190	\$260	\$200
<i>Total Program Spend/Project (wtdavg)</i>	\$3,300	\$3,800	\$4,500
<i>Avg. Invoice (wtdavg)</i>	\$6,300	\$6,600	\$5,500
<i>Total Energy Savings (MMBtu)</i>	2,100,000	1,400,000	1,700,000
<i>Energy Savings/Project (MMBtu; wtdavg)</i>	24	28	33
<i>Marketing Spending</i>	\$4,500,000	\$3,700,000	\$4,400,000
<i>Marketing Spend/Project (wtdavg)</i>	\$87	\$77	\$88
<i>Multifamily Projects</i>	NA	NA	3,204
<i>Low-Income Projects</i>	NA	NA	13,061
<i>Avg. Field Inspection Cost (wtdavg)</i>	\$380	\$380	\$400

## Implementation Challenges: Cost (N=23)

**Sponsors Identifying Each Program Element as Their Most Costly**



## Other Observations

### The HPwES Brand

- 9 Sponsors mentioned the brand as being of great value in lending credibility and trust.
- 2 Sponsors indicated that the brand was not well-recognized in their market, or that was associated exclusively with appliances.

### Out-of-Pocket Expenses

- 4 Sponsors reported challenges in incentivizing homeowners to pursue projects, particularly in the face of considerable out-of-pocket expenses.

### Project Costs

- 4 Sponsors mentioned the relatively higher cost of HPwES projects as being a challenge.

# Sponsor Criteria for Income-Targeted Customers

## Based on Median Income

- Less than 80% State Median (1 Sponsor)
- Less than 80% Area Median (2 Sponsors)
- Less than 60% State Median (2 Sponsors)
- Less than 50% Area Median (1 Sponsor)

## Based on Federal Poverty Level (FPL)

- Less than 200% of FPL (1 Sponsor)
- Between 200% and 300% of FPL (1 Sponsor)

## Based on Other Criteria

- Less than \$72,000 for a household of 4 (1 Sponsor)
- Referrals received from other non-profits (1 Sponsor)



## Questions?

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